

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A process for producing a hardenable composition ~~with high storage stability containing~~ comprising an organic polymer and scaly silica particles which consist essentially of foliar secondary silica particles and have a laminated structure, said process comprising:

(1) ~~a step of~~ subjecting at least one of a silica sol, a silica hydrogel or hydrous silicic acid to hydrothermal treatment in the presence of an alkali metal salt to form tertiary agglomerated particles of the scaly silica particles in the form of porous three-dimensional disorderly agglomerates of foliar secondary silica particles, each secondary particle being formed by a parallel face-to-face alignment of a plurality of flaky primary particles which are overlaid one on another, and

(2) ~~a step of~~ disintegrating and dispersing the tertiary agglomerated particles of silica in an organic polymer in the form of an aqueous emulsion by a wet method.

Claim 2 (Currently Amended): The process according to claim 1, wherein the disintegration and dispersion are carried out ~~by means of~~ with a high speed mechanical stirring wet system pulverizing apparatus employing medium beads.

Claim 3 (Original): The process according to claim 1, wherein the foliar secondary silica particles are a layered polysilicic acid.

Claim 4 (Currently Amended): The process according to claim 1, wherein the main peak in the X-ray diffraction analysis of the foliar secondary silica particles in the hardenable composition corresponds to silica X, ~~and/or~~ silica Y, or both silica X and silica Y.

Claim 5 (Currently Amended): The process according to claim 1, wherein the organic polymer in the form of an aqueous emulsion is at least one homopolymer resin selected from the group consisting of an acrylic resin ~~type~~, an epoxy resin ~~type~~, a urethane resin ~~type~~, a styrene resin ~~type~~, a silicon resin ~~type~~, a fluorine resin ~~type~~, a vinyl chloride resin ~~type~~ and ~~a~~ a polyester resin ~~type~~, a copolymer resin ~~made of comprising~~ at least bonded units thereof ~~two types of them, or a mixture thereof, and a or composite thereof of at least two types of such homopolymer resins and copolymer resins.~~

Claim 6 (Currently Amended): A process for producing a hardenable composition ~~with high storage stability containing comprising an organic polymer and~~ scaly silica particles which consist essentially of foliar secondary silica particles and have a laminated structure, said process comprising:

(1) ~~a step of~~ subjecting at least one of a silica sol, a silica hydrogel or hydrous silicic acid to hydrothermal treatment in the presence of an alkali metal salt to form tertiary agglomerated particles of the scaly silica particles in the form of porous three-dimensional disorderly agglomerates of foliar secondary silica particles, each secondary particle being formed by a parallel face-to-face alignment of a plurality of flaky primary particles which are overlaid one on another,

(2) ~~a step of~~ disintegrating and dispersing the tertiary agglomerated particles of scaly silica particles to foliar secondary silica particles by a wet method, and

(3) ~~a step of~~ disintegrating and dispersing the foliar secondary silica particles in an organic polymer in the form of an aqueous emulsion by a wet method.

Claim 7 (Currently Amended): The process according to claim 6, wherein the disintegration and dispersion are carried out ~~by means of~~ with a high speed mechanical stirring wet system pulverizing apparatus employing medium beads.

Claim 8 (Original): The process according to claim 6, wherein the foliar secondary silica particles are a layered polysilicic acid.

Claim 9 (Currently Amended): The process according to claim 6, wherein the main peak in the X-ray diffraction analysis of the foliar secondary silica particles in the hardenable composition corresponds to silica X, ~~and/or~~ silica Y, both silica X and silica Y.

Claim 10 (Currently Amended): The process according to claim 6, wherein the organic polymer in the form of an aqueous emulsion is at least one homopolymer resin selected from the group consisting of an acrylic resin ~~type~~, an epoxy resin ~~type~~, a urethane resin ~~type~~, a styrene resin ~~type~~, a silicon resin ~~type~~, a fluorine resin ~~type~~, a vinyl chloride resin ~~type~~ and ~~a~~ a polyester resin ~~type~~, a copolymer resin ~~made of~~ comprising at least two ~~types of them~~ bonded units thereof, ~~or~~ a mixture thereof, and ~~a~~ ~~or~~ composite thereof ~~of at~~ least two types of such homopolymer resins and copolymer resins.

Claim 11 (Currently Amended): A hardenable composition ~~with high storage stability~~ ~~having~~ comprising scaly silica particles having a laminated structure consisting essentially of foliar secondary silica particles each of which is formed by a parallel face-to-face alignment of a plurality of flaky primary particles which are overlaid one on another, and fine particles of an organic polymer well-dispersed in an aqueous medium, ~~wherein the composition does~~

~~not substantially sediment the secondary silica particles as a concentrate in a test for storage stability of a coating stipulated in JIS K5400.~~

Claim 12 (Original): The hardenable composition according to claim 11, wherein the foliar secondary silica particles are a layered polysilicic acid.

Claim 13 (Currently Amended): The hardenable composition according to claim 11, wherein the main peak in the X-ray diffraction analysis of the foliar secondary silica particles in the hardenable composition corresponds to silica X, ~~and/or~~ silica Y, or both silica X and silica Y.

Claim 14 (Currently Amended): The hardenable composition according to claim 11, wherein the organic polymer in the form of an aqueous emulsion is at least one homopolymer resin selected from the group consisting of an acrylic resin ~~type~~, an epoxy resin ~~type~~, a urethane resin ~~type~~, a styrene resin ~~type~~, a silicon resin ~~type~~, a fluorine resin ~~type~~, a vinyl chloride resin ~~type~~ ~~and~~ a polyester resin ~~type~~, a copolymer resin ~~made of comprising~~ at least two ~~types of them~~ bonded units thereof, ~~or a mixture or thereof, and a composite thereof of at~~ least two types of such homopolymer resins and copolymer resins.

Claim 15 (Original): The hardenable composition according to claim 11, which is a floor polish composition.

Claim 16 (New): A hardenable composition prepared by the process as claimed in claim 1.

Claim 17 (New): A hardenable composition prepared by the process as claimed in claim 6.

Claim 18 (New): The process as claimed in claim 1, further comprising filtering and washing after the hydrothermal treatment and before disintegrating and dispersing.

Claim 19 (New): The process as claimed in claim 6, further comprising filtering and washing after the hydrothermal treatment and before disintegrating and dispersing.

Claim 20 (New): The process as claimed in claim 1, wherein the tertiary agglomerated particles of silica are disintegrated and dispersed in an aqueous acrylic resin.

Claim 21 (New): The process as claimed in claim 6, wherein the tertiary agglomerated particles of silica are disintegrated and dispersed in an aqueous acrylic resin.

BASIS FOR THE AMENDMENT

Claims 1-21 are active in the present application. Claims 1-15 have been amended for clarity. The amendment to Claim 1 for clarity is not intended to further limit the claim.

Claims 16-21 are new claims. Support for new Claims 16 and 17 is found in the original claims. Support for new Claims 18 and 19 is found on page 43, lines 9-12. Support for new Claims 20-21 is found on page 43, line 25. No new matter is added.

REQUEST FOR RECONSIDERATION

Applicants thank Examiner Turner for the helpful and courteous discussion of November 12, 2003. During the discussion, Applicants' U.S. representative presented arguments that the prior art relied upon by the Office does not disclose the dispersion and disintegration of silica particles which consist essentially of foliar secondary silica particles having a laminated structure in an organic polymer.

In one embodiment of the invention, Applicants have claimed a process for preparing a hardenable composition. The process includes the hydrothermal treatment of at least one of a silica sol, a silica hydrogel or hydrous silicic acid in the presence of an alkaline metal salt. The hydrothermal treatment forms agglomerated particles of a scaly silica. The particles thus formed consist essentially of foliar secondary silica particles having a laminated structure that includes a face-to-face alignment of the primary flaky particles. The particles thus obtained are disintegrated and dispersed in an organic polymer in a wet method.

The disintegrating and dispersing are carried out at the same time in the presence of an aqueous emulsion of an organic polymer (see for example page 33, lines 17-19). When the dispersing and disintegrating are carried out in this manner it is possible to obtain a suspension of the particles which is significantly more resistant to settling than suspensions wherein the disintegrating is carried out in the absence of an aqueous emulsion of the organic polymer and subsequently mixing the disintegrated particles are then mixed with the aqueous emulsion of the organic polymer.

For example, the specification provides Example 1 and Comparative Example 1. In Example 1 the silica particles are dispersed and disintegrated in the presence of an aqueous emulsion of an organic polymer (page 33, lines 6-21). The process of Comparative Example 1 is carried out by first disintegrating the silica particles then mixing the disintegrated silica particles with an aqueous emulsion of an organic polymer (page 48, line through page 49,

line 19). The hardenable composition derived from the Comparative process was unable to provide the storage stability of the hardenable composition derived from the claimed process (page 49, line 25 through page 50, line 9).

The claimed process allows for the preparation of a hardenable composition containing particles which consist essentially of foliar secondary silica particles having the laminated structure mentioned above. The compositions are able to provide improved storage stability and tend to precipitate/settle to a lower degree than prior art compositions.

This may provide benefits including reducing the need to redisperse particulate material present in a coating compositions use.

The Office rejected original Claims 1-15 under 35 U.S.C. § 102(b) in view of Terase I (EP 0904768) and Japanese Applications JP 11-011927 (Terase II), JP 11-029317 (Terase III) and Terase IV (US 6,077,341).¹ Applicants traverse the rejection on the grounds that none of the Terase prior art cited by the Office discloses a process for producing a hardenable composition where disintegration and dispersion is carried out in the presence of an aqueous emulsion and further that that none of the Terase prior art cited by the Office discloses a hardenable composition that contains scaly silica particles that consist essentially of foliar secondary silica particles.

Neither of Terase II or Terase III discloses silica particles that consist essentially of foliar secondary silica particles. Instead, Terase II discloses particles that are described as “composite particles that may be prepared by “surrounding metal” (compd.) fine particles with silica” (see Abstract). Terase III discloses a method for producing scaly silica however Terase III is silent to the preparation of a hardenable composition that comprises an organic polymer and scaly silica particles.

¹ Terase IV was rejected under 35 U.S.C. § 102(e). The Terase IV patent granted on June 20, 2000. The present application was filed on March 19, 2002.

Terase I notes that Terase III discloses a method wherein particulates of a metal oxide are incorporated into scaly silica (see paragraph [0007]). As was mentioned above for the Terase II and Terase III references, Terase I is drawn to a “silica-metal oxide particulate composite” (see paragraph [0001]). Nowhere is the presently claimed invention described in Terase I. In paragraphs [0095]-[0096] of Terase I it is stated:

In a case where the silica-metal oxide particulate composite of the present invention is to be incorporated to a resin, the resin may, for example, be a vinyl chloride resin, of an vinylidene chloride resin, polyethylene, polypropylene, polystyrene, an ABS resin, polycarbonate, nylon, a polyacetyl resin, a polyamide resin, a polyimide resin, a melamine resin, a silicone resin, an acrylic resin, a methacrylic resin, a phenol resin, a polyester resin, a urea resin or a fluorine resin.

Further, in the case where it is to be incorporated to a coating material, the resin fluoro coating material may, for example, be a polyvinyl alcohol resin, a vinyl chloride/vinyl acetate resin, an acrylic resin, an epoxy resin, an alkyd resin, a polyester resin, a urethane resin, a polyamide resin, a polyimide resin, a phenol resin or an amino resin, which may be dispersed in water or an organic solvent to form a coating material.

This disclosure in Terase I does not anticipate the presently claimed process or presently claimed hardenable composition. The composition as described in Terase I as quoted above must contain a silica-metal oxide particulate composite. The presently claimed process requires that disintegration and dispersion are carried out in the presence of an aqueous emulsion of an organic polymer. The presently claimed hardenable composition requires that the silica particle consist essentially of scaly silica particles. A composition which consists essentially of scaly silica particles excludes silica-metal oxide particulates.

The transitional phrase “consisting essentially of” is used to describe compositions which contain at least the components explicitly disclosed in the claim and may further contain additional components so long as the additional components do not materially affect the basic and novel characteristics of the claimed invention. As stated in In re Janakirama-Rao, 137 USPQ 893 (CCPA 1963), “[t]he word “essentially” opens the claims to the

inclusion of ingredients which would *not* materially affect the *basic novel* characteristics...”
(emphasis in the original; see also MPEP § 2111.03-Transitional Phrases).

Applicants submit that it is readily recognized in the art that including, for example, metal oxide particulates in scaly silica particulates will affect the properties of the scaly particulates. The presence of metal particulates will, for example, affect the UV-absorbing ability of the scaly silica particles (see paragraph [0004] of Terase I).

Therefore, as already mentioned, the transitional phrase “consisting essentially of” to limit the scaly silica particles recited in the present claims, functions to exclude scaly silica particles that contain particulates of metal oxides.

Nowhere in any of the Terase references is it disclosed that a hardenable composition can be produced with only the scaly silica particle and an organic polymer by disintegrating and dispersing the particles in the presence of an aqueous emulsion of an organic polymer. The present claims are therefore novel and not obvious in view of the Terase patents on the ground that Terase is silent to the conditions of the claimed process and is further silent to compositions which contain scaly silica particles without metal oxide particulates.

Likewise Terase IV is drawn to silica-metal oxide particulate compositions (see column 1, lines 6-7). Nowhere in Terase IV is it disclosed or suggested that a hardenable composition can be prepared by the presently claimed process.

Applicants submit that the presently claimed invention is novel and not obvious in view of the disclosure of Terase IV as supported by Terase IV’s silence with respect to the process and hardenable compositions as recited in the present claims.

Applicants submit the presently claimed invention is novel and not obvious in view of the prior art relied upon by the Office and respectfully request the withdrawal of the rejections. Applicants submit that all now-pending claims are in condition for allowance and respectfully request their passage to Issue.

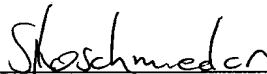
Application No. 10/099,971

Reply to Office Action of September 25, 2003

Applicants submitted a List of Related Cases on March 19, 2002 with the specification as originally filed. Applicants respectfully request the return of a signed, initialed and dated copy of the List of Related Cases to make of record the consideration of at least the claims and Drawings of the references provided thereon in the examination of the above-identified application. Alternatively, a statement in the next communication from the Office acknowledging the consideration thereof is solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Norman F. Oblon
Attorney of Record
Registration No. 24,618

Customer Number

22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/03)
NFO:SUK/bu

Stefan U. Koschmieder
Registration No. 50,238